

REMARKS

Claims 1, 4, 6, 7, and 10-21 are currently pending. Claims 12-21 have been withdrawn due to restriction requirement. Claims 3 and 5 have been cancelled. Claims 1 and 4 have been amended to incorporate the subject matter of cancelled claim 3 and to provide proper claim dependency, respectively. No new matter has been added.

35 U.S.C. § 103 Claim Rejection

Claims 1, 3-7, 10, and 11 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over either US Patent No. 5,970,564 (hereafter “Inns”) or US Patent No. 5,355,546 (hereafter “Scheier”) in view of US Patent Publication No. 2004/0025275 (hereafter “Moskovich”). Applicants respectfully traverse this rejection because the cited references neither individually nor in combination teach the claimed invention.

The Action alleges that Inns discloses a toothbrush head which incorporates a mass of polyurethane in which the ends of nylon bristles are embedded and bonded, and that Scheier discloses a toothbrush head which incorporates a mass of elastomeric polyurethane supporting tufts of nylon bristles which are secured in various ways. The Action further alleges that both Inns and Scheier disclose the present invention except for the use of a polyurethane gel material.

Inns disclose setting the bristles in elastomer. See the title “Brush having an elastomeric bridge”. The only polyurethane elastomers mentioned in Inns are in col 5 line 36-42:

In an alternative embodiment of the invention, the bridge material is a thermoplastic polyurethane which adheres to both the nylon bristles and the polypropylene skeleton (3). A preferred thermoplastic polyurethane is ESTANE available from BF Goodrich e.g. ESTANE 58201 (82A) (PET) and ESTANE 58271 (88A) (PES).

According to the online data sheets (attached hereto) of these two polyurethanes they are “elastomeric materials that bridge the gap between flexible rubber and rigid plastics. These materials offer unmatched toughness and durability in a flexible thermoplastic elastomer system.” 58201 and 58271 have hardness Shore A 82.0 and 85.0, respectively – much greater than the hardness of less than 10 Shore A as specified in claim 1. These two polyurethanes referred to by Inns are therefore relatively hard elastomers akin to hard rubbers.

Scheier also discloses setting the bristles in elastomeric material. See col. 2 line 59-67:

The embodiments of this invention, each comprises a readily flexed resilient member which carry the bristles for cleaning the teeth and gums. The resilient member can be planar or arcuate in shape and is formed of any natural or synthetic elastomeric material having the required properties suitable for the intended use. Such elastomers include low or high density polyethylene, tetrafluoroethylene (Teflon), polyurethane and polypropylene. The bristle tufts can be secured to the resilient member in any suitable manner, including mechani-

and for example col. 3 line 19: "any suitable elastomeric material". It is known that polyurethanes can be elastomers, so Scheier's reference to polyurethanes does not detract from the generality of Scheier's requirement for an elastomer. Moreover Scheier's polyurethane is listed together with the normally hard and rigid polyethylene and polypropylene. The implication is that, like in Inns, harder less flexible elastomers are selected.

The Examiner alleges that Moskovich shows use of a gel material for the purpose of being the material in which the bristles are secured. From this the Examiner alleges it would be obvious to use the gel material disclosed in Moskovich in place of the elastomer of Inns and Scheier.

The Examiner's only basis for the allegation that Moskovich shows use of a gel material for the similar purpose as Inns and Scheier of being the material in which the bristles are secured, is paragraph [0026].

[0026] The elastomer material covering shelf-like protrusions **28** could additionally include, for example, a soft gel material to which the cleaning elements **30** are directly mounted. It is preferable that the types of cleaning elements

In Moskovich the first mention of how cleaning elements are mounted occurs is in paragraph [0005], which teaches that its toothbrush bristles are mounted on the shelf like protrusions 28. The material of which these shelf like protrusions are made appears to be either a hard plastic material integral with the central region, (see paragraph [0019]), or a less hard material than the central section (see paragraph [0006]). Thereafter, paragraph [0006] of Moskovich teaches that these shelf like protrusions are covered with the elastomeric material. Paragraph [0019] describes how the shelf like protrusions are made of hard plastic, but made very thin "to create flexible mounts for the cleaning bristles" and the flexibility of these mounts is enhanced, not

created, by the covering of elastomer material. Paragraph [0017] refers to the need for careful integration of the elastomer with the plastic material to achieve suitable flexibility. Paragraph [0026] of Moskovich states that the bristles are “held” by the flexible elastomeric material, and this appears from the context to be a holding additional to the mounting of the cleaning elements such as bristles to the shelf like protrusions as previously mentioned.

The Examiner appears to take paragraph [0026] of Moskovich alone and out of the overall context of Moskovich as discussed above, i.e. the mounting of the cleaning elements on the shelf like protrusions with elastomer covering the shelf like protrusion. It is not clear from paragraph [0026] what the relationship between the cleaning elements 30, the shelf-like protrusion 28, the elastomer and the gel might be, except that this elastomer material “could additionally include, for example, a soft gel material to which the cleaning elements are directly mounted”. No clarification is provided in any of the other description or drawings of Moskovich as to how one might “include” this soft gel material in the elastomer, or what the chemical nature of this soft gel might be.

The clear implication is that the bristles are mounted directly on the plastic material of the shelf like protrusions, and that thereafter these shelf like protrusions are covered with the elastomer, with or without inclusion of the soft gel.

The Examiner further alleges that it would have been obvious to use such a gel material for the same purpose as Inns or Scheier (Office Action, page 3). This allegation appears to be incorrect for the following reasons:

First, Moskovich does not use its soft gel for the same purpose as Inns or Scheier, or for the same purpose as the present invention, but only for covering (together with an elastomer) bristles which are mounted on the hard plastic shelf like protrusion, and there is no logical reason why anyone should read across from Moskovich’s use to Inns’ or Scheier’s.

Second, in view of the preference in both Inns and Scheier for relatively hard elastomers for their toothbrush heads it is very unlikely that the skilled reader would choose to use the soft gel of Moskovich for the same purpose of mounting toothbrush bristles. Therefore contrary to the Examiner’s allegation it would not be obvious to substitute Moskovich’s gel for the elastomers of Inns and Scheier.

Further, both Inns and Scheier refer to use of elastomeric materials, and exemplify these with relatively resilient rubber-like or hard plastic-like elastic materials. The presently claimed “visco-elastic” polyurethane gel is technically different from elastic materials. The difference in physical properties between elastic and visco-elastic materials is well known.

Viscoelasticity is the property of materials that exhibit both viscous and elastic characteristics when undergoing deformation. Viscous materials resist shear flow and strain linearly with time when a stress is applied. Elastic, i.e. elastomeric, springy or rubbery materials strain instantaneously when stretched and just as quickly return to their original state once the stress is removed. Viscoelastic materials have elements of both of these properties and, as such, exhibit time dependent strain. Whereas elasticity is usually the result of bond stretching along crystallographic planes in an ordered solid, viscosity is the result of the diffusion of atoms or molecules inside an amorphous material.

Unlike purely elastic substances, a viscoelastic substance has an elastic component and a viscous component. The viscosity of a viscoelastic substance gives the substance a strain rate dependent on time. Purely elastic materials do not dissipate energy (heat) when a load is applied, then removed. However, a viscoelastic substance loses energy when a load is applied, then removed. Hysteresis is observed in the stress-strain curve, with the area of the loop being equal to the energy lost during the loading cycle. Since viscosity is the resistance to thermally activated plastic deformation, a viscous material will lose energy through a loading cycle. Plastic deformation results in lost energy, which is uncharacteristic of a purely elastic material's reaction to a loading cycle.

Therefore Inns' and Scheier's preference for these hard rubbery materials points away from substitution with either the present claimed viscoelastic material, or Moskovich's "soft gel", whether that be viscoelastic or not.

Further, neither Inns nor Scheier suggests the advantages of the defined softness of less than 10 Shore A referred to on present page 7 third paragraph in improving the flexible mounting of bristles, the deformation of the polyurethane to absorb excessive brushing pressures and to adapt the ends of the bristles to the contours of teeth and gums. As mentioned above Inns and Scheier point toward harder polyurethanes of hardness Shore A in the 80's. As explained above, Moskovich gives no clear indication of how his "soft gel" is used, other than that it is being used with an elastomer, and in connection with the hard plastic of the shelf like protrusions and in a manner different from the present embedding of the bristle ends in the gel material, and Moskovich gives no suggestion of what a suitable hardness might be. Therefore the defined hardness of the polyurethane gel of present amended claim 1 is not obvious over Inns, Scheier or Moskovich.

Accordingly, for at least reasons, Applicants respectfully request withdrawal of the rejection of the claims under 35 U.S.C. § 103(a).

Conclusion

In view of the foregoing, favorable reconsideration and an indication of allowability of all pending claims is requested respectfully. Should the Examiner have any questions or wish to discuss any aspect of this case, the Examiner is encouraged to call the undersigned attorney at the number below.

Respectfully submitted,

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